

# Lessons for Hope: Pedagogy to Promote Climate Change Literacy and Resilience

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**Keywords:** climate change education; climate literacy; climate change resilience

Climate literacy is generally accepted to be competence or knowledge around climate change, its impacts, and its solutions (Johnston, 2020). To improve climate literacy, the social sciences must be more fully integrated with the biophysical basis of climate change (Shwom et al., 2017). However, in a systematic review of research on climate change education strategies, Monroe et al. (2019) identified very few educational programs that intentionally approached climate change from both social and science disciplines. Social science perspectives are critical to give students an understanding of the interdisciplinary nature of climate change solutions and adaptations, and to promote hope for addressing change (Duram, 2021). The way climate change is taught is also important – education research from various disciplines demonstrates that students are more likely to feel empowered and resilient in the face of the climate crisis if active and authentic learning experiences are emphasized (Cross & Congreve, 2021; Duram, 2021; Monroe et al., 2019; Simm et al. 2021) and pedagogy is used that creates a sense of community and acknowledges and addresses students' emotional responses to climate change (Campbell, 2023; Verlie, 2020).

I have been teaching an online large-enrolment interdisciplinary climate change course for seven years, that now has 400-600 students per offering, representing every Faculty in the University. The course covers climate change science, human responses, and solutions. As the student body in the course diversifies and the climate crisis worsens, I have observed an increase in climate distress among the students. In response, this research aims to:

- 1. Characterize students' emotional responses to learning about climate change.**
- 2. Assess what pedagogy is most effective at promoting students' climate change literacy, resilience, and hope.**

This study took a two-part approach: Part 1 investigates the effectiveness of the course in improving climate change literacy, using a validated climate change knowledge concept inventory to assess students' misconceptions about climate change before and after taking the course (Libarkin et al., 2018). Results demonstrate that students enter the course with limited climate change knowledge and holding several common misconceptions and that they leave the course with improved climate literacy. Key factors in correcting their initial misconceptions are the interdisciplinarity of the course and active and authentic learning pedagogy. Part 2 uses results from a student survey and content analysis of assignments to characterize emotional responses to learning about climate change, and to identify pedagogy that counters climate change distress and promotes student resilience and hope. Students experience a range of both positive and negative emotional responses and indicate that the course components that leave them feeling hopeful and resilient are assignments focused on scientific knowledge, solutions that help achieve Paris Agreement targets, and prompted conversations with peers in the course. This study identifies and promotes pedagogy that both improves climate literacy and instills resilience and hope in the face of the climate crisis.

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